

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSERVATION PRACTICE STANDARD

## HERBACEOUS WIND BARRIERS

(Ft.)

CODE 603

### DEFINITION

Herbaceous vegetation established in rows or narrow strips in the field across the prevailing wind direction.

### PURPOSES

This practice may be applied as part of a resource management system to support one or more of the following:

- Reduce soil erosion from wind.
- Protect growing crops from damage by wind-borne soil particles.
- Manage snow to increase plant available moisture.
- Provide food and cover for wildlife.

### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland or other land where crops are grown.

### CRITERIA

#### General Criteria Applicable to All Purposes

**Vegetation.** Criteria for the establishment of herbaceous vegetation shall be made from guidelines provided in the Field Office Technical Guide (FOTG), Section IV. Perennial grasses shall be planted according to Conservation Practice Standards 550, Range Planting, and 512, Pasture and Hayland Planting. Annual crops shall be planted according to Conservation Practice Standard 340, Cover and Green Manure Crop.

Single species or mixture of species may be seeded depending on the purpose(s). Plant

materials shall be selected for the following characteristics:

- Adaptation to local soil and climate conditions. See Kansas Plant Materials Technical Note No. 1 (Rev. 6) for a listing of approved grass varieties.
- Stiff, erect non-spreading growth habit.
- Resistant to lodging.
- Good leaf retention.
- Minimum competition with adjacent crops.
- Provide suitable wildlife habitat.

**Number of rows.** Barriers shall consist of a minimum of two rows and the rows shall contain no gaps. The rows shall be spaced no more than 36 inches apart.

**Barrier Direction and Spacing** The effective spacing between barriers shall be determined using current approved wind erosion prediction technology.

**Harvest.** Harvest of hay or seed from perennial barriers, grazing, or mowing for weed control, shall be managed to allow regrowth to the planned height before periods when wind erosion, crop damage, or drifting snow are expected to occur. Annual barriers will be managed so barriers are of sufficient height and condition to meet their intended purpose.

#### Additional Criteria to Reduce Soil Erosion from Wind

**Barrier Height.** Barriers designed for this purpose shall have a minimum expected height of 1.5 foot during the wind erosion period for which the barriers are designed.

**Barrier Porosity.** Barriers established for this purpose shall be designed to achieve a porosity of 40 to 50 percent.

**Barrier Direction and Spacing.** The spacing between barriers shall be measured along the prevailing wind erosion direction during the critical wind erosion period (s) being planned for on the field. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the soil loss tolerance (T) or other planned soil loss objective.

When barrier direction deviates from perpendicular to the prevailing wind direction, the spacing between barriers shall be correspondingly reduced.

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology in Section I of the FOTG. Wind erosion calculations shall account for the effects of other practices/management in the conservation management system.

**Additional Criteria to Protect Growing Crops From Damage from Wind-borne Soil Particles**

**Barrier Height.** Barriers designed for this purpose shall have a minimum expected height of 2 feet foot during those periods when growing crops are susceptible to damage by wind or wind-borne soil particles. The designed height of the barrier will depend on the distance between the barrier and the crop being protected, and the crop height at which it will no longer need the protection of a barrier.

**Barrier Porosity.** Barriers established for this purpose shall be designed to achieve a porosity of 40 to 50 percent during the period when growing crops are to be protected.

**Barrier Direction and Spacing.** The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the crop tolerance to damage from wind erosion. Crop tolerance to wind erosion is the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation. Refer to the following table:

Table 1. Estimated Crop Tolerances to Blowing Soil Maximum Rate in Tons/Acre/Year				
0	0.5	1	2	5
Carrots	Peas	Alfalfa	Corn	Barley
Cucumbers	Lima Beans	Asparagus	Sorghum	Buckwheat
Lettuce	Snap Beans	Broccoli	Sweet Corn	Oats
Onions	Tomatoes	Cabbage	Sunflower	Rye
Spinach		Cotton		Wheat
Squash		Eggplant		
Table Beets		Peppers		
Watermelons		Potatoes		
		Soybeans		
		Sugar Beets		

When barrier direction deviates from perpendicular to the prevailing wind direction, the spacing between barriers shall be correspondingly reduced.

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology in Section I of the FOTG. Wind erosion calculations shall account for the effects of other practices/management in the conservation management system.

**Additional Criteria to Manage Snow to Retain Additional Soil Moisture**

**Barrier Height.** Barriers designed for this purpose shall have a minimum expected height of 1.5 foot during periods of expected snow cover.

**Barrier Porosity.** Barriers established for this purpose shall be designed to achieve a porosity of 60 to 75 percent during periods of expected snow cover.

**Barrier Direction and Spacing.** The effective spacing shall be measured along the prevailing wind erosion direction during periods of expected snow cover. For uniform distribution of the drifting snow, spacing shall not exceed 10 times the expected height of the barrier.

When barrier direction deviates from perpendicular to the prevailing wind direction, the spacing between barriers shall be correspondingly reduced.

### **Additional Criteria to Provide Food and Cover for Wildlife**

**Vegetation.** Barriers established for this purpose shall consist of plants that provide food and cover for the targeted wildlife species. See Conservation Practice Standard 645, Wildlife Upland Habitat Management.

**Barrier Width.** Barriers shall have a minimum width of 2 feet.

**Barriers Height.** Barriers shall have a minimum expected height that provides adequate cover for the targeted wildlife species.

### **CONSIDERATIONS**

Transport of wind-borne sediment and sediment-borne contaminants offsite are reduced by this practice when used in a resource management system.

Herbaceous wind barriers are more suitable than field windbreaks for use under center pivot irrigation systems due to height considerations. Windbreaks may be located outside the windward edge of the circle.

Spacing between barriers may be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Selection of plants for use in barriers should favor species or varieties tolerant to herbicides used on adjacent crops.

Certain plants may be alternate hosts for pests injurious to adjacent crops and may not be satisfactory for use in barriers. Consider plants that serve as a home for beneficial insects, pollinators, and pest predators. Consider planning barriers as trap strips to attract undesirable insects such as virus spreading aphids.

Selection of plant species less palatable to animals may reduce damage to barriers from grazing wildlife.

Where water erosion from melting snow is a concern, supporting erosion control practices such as residue management can reduce the hazard. Where feasible, aligning barriers across the slope can enhance moisture infiltration and reduce erosion.

When barriers are designed to enhance wildlife habitat, plant species diversity should be encouraged. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use.

If the barrier is also designed to provide escape or nesting cover for wildlife, locate barriers where they connect areas of existing perennial vegetation whenever possible and include plants that will have a minimum expected height that provides adequate cover for the targeted species. Barriers that connect areas such as woody draws often provide additional escape and travel cover. Two or more rows are often more effective than one row, with a minimum width of two feet between rows. Stiff stems are important in providing cover during severe winter storms.

Encourage the use of adapted native plant materials whenever possible.

### **PLANS AND SPECIFICATIONS**

Specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit.

For design, use Field Sheet KS-ECS-4 and narrative statements in the conservation plan. In addition, location of barriers including direction and alignment in the field, distance between barriers, barrier width, and erosion prediction documentation will be provided. Practice application will be documented on Field Sheet KS-ECS-4 and in the conservation plan.

### **OPERATION AND MAINTENANCE**

Annual barriers shall be established each year by planting at recommended dates and leaving rows standing and maintained throughout the critical period for which the barrier was designed.

Gaps in perennial barriers shall be replanted as soon as practical to maintain barrier effectiveness.

After establishment, perennial barriers shall be fertilized as needed. Weeds shall be controlled by cultivation, spot treatment when using chemicals, or other acceptable methods.

Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field as determined appropriate.

Barriers shall be re-established or relocated as needed.

Barriers composed of perennial vegetation that are designed to enhance wildlife habitat should not be mowed unless their height or width exceeds that required to achieve the

barrier purpose, or they become competitive with the adjoining land use. When mowing is necessary, it shall be done during the non-nesting season.

Prescribed burning to enhance plant vigor may be completed after nesting/resting periods.